



**UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/057,455	04/09/98	HAMADA	T 19680-01

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YOUNG & THOMPSON
745 SOUTH 23RD STREET 2ND FLOOR
ARLINGTON VA 22202

EXAMINER

BERMAN, J

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 05/18/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/057,455

Applicant(s)

HAMADA, TAKEHIKO

Examiner

Jack I. Berman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2000.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 20) ☐ Other: _____

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 12, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims all contain limitations which contradict limitations in the claims from which they depend. Claims 6 and 12 claim that either secondary or reflected electrons are detected and that the positions of the electron beam at the start of the scan and at the time the amount of these detected electrons change are used to measure the size of the portion to be measured, a process which inherently involves detecting the position of this portion; however, these claims depend from claims 1 and 7, respectively, which claim that the detection of secondary or reflected electrons are not involved in detecting the position of the portion to be measured. This is a contradiction. Claim 20 claims a position detecting system configured to detect the position of a gate electrode on a gate oxide film covering a device region confined in a surface of a silicon substrate; however, claim 20 depends from claim 15 which claims a system for detecting the position of the bottom of a contact hole through an insulating film on a silicon substrate. Since a gate electrode on a gate oxide film covering a device region confined in a surface of a silicon substrate is not the bottom of a contact hole through an insulating film on a silicon substrate, this is also a contradiction.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munakata in view of Kato et al. and Ichihashi et al. for the reasons explained in the previous Office action.

Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munakata, Kato et al., Ichihashi et al., and Todokoro et al. for the reasons explained in the previous Office action.

Applicant's arguments filed April 6, 2000 have been fully considered but they are not persuasive. Munakata et al. teaches at lines 19-26 in column 5 that it is not necessary to detect secondary or reflected electrons while an electric current induced in the specimen as it is scanned with the electron beam is detected.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Peckerar et al.. As is explained at lines 22-34 in column 4, line 14 in column 7 through line 11 in column 8, and illustrated by EXAMPLE 1 at lines 19-59 in column 8, Peckerar et al. discloses a position detecting system for detecting the bottom of contact holes (apertures 16) through an insulating film (electron beam absorber layer 12) on a silicon substrate (illustrated in Figure 6) by scanning an electron beam across the surface of the substrate while applying a voltage to the rear surface of the substrate (as is also illustrated in Figure 6) so that a current is detected through the substrate only when the electron beam strikes one of the apertures in the insulating film.

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Claims 13, 14, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munakata, Kato et al., and Ichihashi et al. as applied to claims 1-4 and 7-10 in the previous Office action, and further in view of Peckerar et al.. Munakata does not describe in detail how the bias voltage is applied to the specimen or where the current detecting means detects the current in the specimen, it would therefore have been obvious to a person having ordinary skill in the art locate the means for performing both these functions on the bottom of the sample in the manner taught by Peckerar et al.. As was explained in the previous office action, Kato et al. teaches that scanning electron beam systems, such as that disclosed by Peckerar et al., can be used to measure distances between points on the sample. One of the measurement methods taught by Kato et al., as summarized at lines 26-30 in column 2, involves determining the position of a mark on the sample image by measuring the delay between a beam scanning start time and the time at which the scanning electron beam reaches the position represented by the mark. According to Kato et al., the size of any given feature on the specimen can be measured by making a mark on opposing edges of the feature and measuring the distance between the two marks. Ichihashi et al. teaches that instead of the operator arbitrarily choosing two marks to indicate a distance to be measured, means can be provided to select the opposing edges by detecting the changes in the signals generated by the interaction of the electron beam and the specimen. While both Kato et al. and Ichihashi et al. illustrate embodiments of their inventions wherein either secondary or reflected electrons are detected, both patents state (Kato et al. at lines 11-20 in column 1 and Ichihashi et al. at lines 5-8 in column 3) that any signal generated by the interaction of the electron beam and the specimen can be used. Munakata teaches at lines 27-32 in column 1, that specimen currents are known in the art to be equivalent to back-scattered or

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secondary electrons for purposes of detection in scanning electron microscopes to indicate the interaction of an electron beam with a specimen. It would therefore have been obvious to a person having ordinary skill in the art to use Kato et al.'s measuring system to measure distances between points observed using the Peckerar et al. scanning electron microscope with changes in the detected signals being used to indicate the points to be measured, in the manner taught by Ichihashi et al..

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peckerar et al., Munakata, Kato et al., and Ichihashi et al. as applied to claims 13, 14, and 16-18 above, and further in view of Todokoro et al.. As was explained in the previous Office action, Todokoro et al. teaches at lines 56 in column 1 through 14 in column 2 that the presence of passivation layers on integrated circuits creates a capacitance which prevents the observation of DC voltages in the integrated circuits by scanning electron microscopes. According to Todokoro et al., the way to overcome this problem is to periodically vary the bias voltage applied to the integrated circuit sample. It would therefore have been obvious to a person having ordinary skill in the art to periodically vary the bias voltage applied to the sample in the Peckerar et al./Munakata/Kato et al./Ichihashi et al. method and apparatus discussed above in order to overcome the capacitance problem disclosed by Todokoro et al..

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

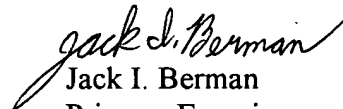
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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (703) 308-4849. The examiner can normally be reached on M-F (9:30-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teresa M. Arroyo can be reached on (703) 308-4782. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Jack I. Berman
Primary Examiner
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jb
May 17, 2000